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1. In the process of repairing oil barges, the operations preparatory to the repair occupy a particularly important place.

   (a) pumping out the cargo;

   (b) initial degassing, which consists of ventilation of the holds;

   (c) cleaning the barge, which consists of lowering people into the holds of the barge, collecting the residue oil products in pails and rubbing down the bottom, sides and ceiling with sawdust and rage;

   (d) steaming the holds of the barge, which consists of filling all tanks with steam for six to 10 hours;

   (d) washing the holds, which consists of lowering people again into the holds of the barge to wash the inner surfaces of the tanks with water and rub them dry with rags.

   Not until these operations have been carried out is it possible to begin the repair of a barge.

2. The operation of cleaning the holds of oil barges is extremely laborious, taking up to 10 days or more. For the most minor repair, as, for example, welding a seam - an operation lasting 1½ - 2 hours - it is necessary to carry out a lot of cleaning work, costing hundreds of thousands of rubles each time when one takes into account economic losses while the barge is idle.

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3. The workers in maritime and river transport were confronted with the problem of finding a method of repairing oil tankers which would make it possible to avoid trimming and cleaning up the holds.

4. In the summer of 1950 work on the solution of this problem was begun at the initiative of the Lupichev, the Chief of the Kuibyshev Operations Sector /UChASTOK/ of the steamship agency Volgatanker /Volga Oil Tanker Steamship Agency/. Under Lupichev's leadership a group of researchers was formed which included workers of river transport and associates of the Kuibyshev Industrial Institute. The researchers based their experiments on the following ideas: It is well known that the burning of oil and its products can take place only when there is air in the space around them. If the space above the oil is filled with a non-combustible gas, the oil cannot ignite. The search for an inexpensive, non-combustible gas complicated the problem. Finally it was decided to use as such a gas, smoke which contains carbon dioxide and therefore smothers fire.

5. At first experiments were conducted. The usual explosive atmosphere was created in hermetically sealed glass jars. In the jar where the empty space above the oil had not been filled up with smoke, a spark caused an instantaneous explosion. In another jar which had been pumped full of smoke, the oil did not ignite. Thereafter the experiments were carried out on a larger scale - with carboys, barrels and tanks.

6. Finally in the middle of June 1951 an experiment was carried out under production conditions, in the presence of representatives of the steamship agency and the fire guard. The oil barge "Sok", with gasoline inside, was used for the experiment. The launch /barkas/ "Artem Sergeev" (a steam-tug used for maneuvering in the roadstead), on which the apparatus for delivering the smoke had been set, approached the barge. The smoke, obtained from the launch's fire box, was passed through a cooling chamber where its temperature was lowered and incandescent particles were removed. From the cooling chanber the smoke was delivered through an ordinary hose (such as is used in pumping oil products) to the main receiving hatch of the barge [illegible] closed system (through a spherical flange /coupling/). All hatches and gas vents on the barge were closed. Regulation of the delivery of smoke to individual tanks was effected by means of gate valves /zadvizhka/. When the delivery of the smoke was finished an electric welding apparatus was turned on. The welder cut a large opening in the side and welded on a patch. The gasoline under the layer of smoke did not ignite. People were smoking freely on the barge.

7. The new method of repair for oil tankers made it possible for the steamship agency Volgatanker to make a saving of more than 6.5 million rubles during half of 1951 alone.

8. At the present time this method is beginning to be extended not only in the River Fleet but also in the Merchant Fleet and on railroads. The method is of considerable help to industry as well - for the repair of reservoirs and depots for liquid fuel at factories and plants.

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